

TITLE: METHOD AND SYSTEM FOR MODELING CELLULAR METABOLISM

PRIORITY STATEMENT

msy
e/10/09
This application claims ^{benefit of} ~~priority to~~ Provisional Patent Application No. 60/260,713 filed January 10, 2001 and Provisional Patent Application No. 60/278,535 filed March 23, 2001, both of which are herein incorporated by reference in their entirety.

FIELD OF THE INVENTION

This invention relates to methods and systems for *in silico* or bioinformatic modeling of cellular metabolism. More specifically, although not exclusively, this invention relates to a framework of models and methods that improve upon flux balance analysis (FBA) models through incorporation of particular constraints. These constraints incorporate, without limitation, qualitative kinetic information, qualitative regulatory information, and/or DNA microarray experimental data. Further, the present invention relates to solving various metabolic problems using particular computational procedures.

BACKGROUND OF THE INVENTION

Metabolic pathway engineering has attracted significant interest in recent years catalyzed by the rapidly increasing number of sequenced microbial genes. As of January 2001, over fifty microbial genomes were completely sequenced. Bioinformatic tools have allowed the functional assignment of 45 to 80 % of their coding regions. E. Pennisi, Science 277, 1432 (1997). This newly acquired information is used in conjunction with microbial mathematical models to calculate the response of metabolic networks after gene knockouts or additions. For example, such information was used to increase ethanol